

CLAIMS

I/We claim:

1. A system for providing an end of travel feedback from a road wheel to a driver of a vehicle, the vehicle including a steer by wire system, the system comprising ;

a steering wheel configured to control the steer by wire system;

a steering shaft coupled to the steering wheel; and

a clutch adapted to couple the steering shaft with the road wheel when the road wheel is in an end of travel condition.

2. The system according to claim 1, further comprising a controller adapted to sense when the road wheel has reached an end of travel position and to engage the clutch in response thereto.

3. The system according to claim 1, wherein the controller is adapted to engage the clutch based on the angle of the road wheel.

4. The system according to claim 1, wherein the controller is adapted to engage the clutch based on a rate of change of the angle of the road wheel.

5. The system according to claim 1, further comprising a motor to control an angle of the road wheel.

6. The system according to claim 5, wherein the controller is adapted to engage the clutch based on a current draw of the motor.

7. The system according to claim 1, further comprising a controller adapted to disengage the clutch when the steering wheel is manipulated to rotate the wheel away from the end of travel position.

8. The system according to claim 7, wherein the controller is adapted to disengage the clutch based on an angle of the steering wheel.

9. The system according to claim 7, wherein the controller is adapted to disengage the clutch based on a rate of change of the steering wheel angle.

10. The system according to claim 7, wherein the controller is adapted to disengage the clutch based on a torque applied to the steering wheel.

11. The system according to claim 1, further comprising a controller adapted to sense when the angle of the road wheel is restricted due to the road wheel pushing against an object.

12. The system according to claim 11, wherein the controller is adapted to engage the clutch based on a current draw of a motor configured to control the angle of the road wheel.

13. The system according to claim 11, wherein the controller is adapted to engage the clutch based on the angle of the road wheel.

14. The system according to claim 11, wherein the controller is adapted to engage the clutch based on the rate of change of the angle of the road wheel.

15. A method for providing an end of travel feedback to a driver of a vehicle, the vehicle including a steer by wire system and a road wheel, the method comprising the steps of:

controlling the steer by wire system with a steering mechanism;
sensing an angle of the road wheel is at an end of travel position; and
coupling the steering mechanism to the road wheel mechanically.

16. The method according to claim 15, wherein the steering mechanism is coupled to the road wheel by engaging a clutch.

17. The method according to claim 16, wherein the clutch is engaged based on the angle of the road wheel.

18. The method according to claim 16, wherein the clutch is engaged based on a rate of change of the angle of the road wheel.

19. The method according to claim 16, further comprising the step of controlling an angle of the road wheel using a motor.

20. The method according to claim 19, wherein the clutch is engaged based on a current draw of the motor.

21. The method according to claim 15, further comprising the step of decoupling the steering mechanism from the road wheel when the steering wheel is manipulated to rotate the wheel away from the end of travel position.

22. The method according to claim 21, wherein the steering mechanism is decoupled from the road wheel based on the angle of the steering wheel.

23. The method according to claim 21, wherein the steering mechanism is decoupled from the road wheel based on a rate of change of the steering wheel angle.

24. The method according to claim 21, wherein the steering mechanism is decoupled from the road wheel based on a torque applied to the steering mechanism.